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ORIGINAL ARTICLE

Paramedics' Knowledge on Intraosseous Cannulation

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ABSTRAK

Akses untuk laluan intravena (IV) adalah amat penting didalam rawatan resusitasi pesakit kecemasan. Kerumitan mengakses laluan intravena akan menyebabkan kesukaran dalam pemberian cecair dan ubat yang boleh mempengaruhi kesan rawatan kepada pesakit. Dalam keadaan tiada laluan intravena, akses alternatif adalah kanulasi intraosseous. Pada masa ini, tidak ada data mengenai kelaziman dan corak pengetahuan tentang kanulasi intraosseous dikalangan paramedik kecemasan dalam penerbitan negara kita, walaupun penggunaan kanulasi intraosseous untuk pesakit kecemasan sedang diamalkan. Oleh itu, tujuan kajian ini adalah untuk mengenalpasti tahap pengetahuan tentang kanulasi intraosseous dikalangan paramedik kecemasan. Pengetahuan berkaitan dengan kanulasi intraosseous dikalangan paramedik kecemasan dinilai melalui soalan ujian berstruktur yang disahkan. Lima belas paramedik mengambil bahagian didalam kajian ini. Majoritinya adalah lelaki (86.6%). Kumpulan umur adalah diantara 22-45 tahun. Pengalaman bekerja pula adalah diantara 2-13 tahun. Terdapat hanya 1 daripada 15 peserta yang telah mencapai skor markah 75%. Majoriti (10) mencapai skor markah diantara 40% hingga 50%. Ini menunjukan bahawa pengajaran kanulasi intraosseous dikalangan paramedik kecemasan perlu diberi penekanan.

Kata kunci: pengetahuan paramedik, kanulasi intraosseous, alternatif, akses kepada intravena

ABSTRACT

Access to an intravenous (IV) route is very crucial in emergency patients under resuscitation. The difficulty to access and administer fluid and drugs through intravenous will influence the outcome of patient. In case of unavailable of

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intravenous route, the alternative is intraosseous access. To date, there is no data available on the prevalence and pattern of intraosseous cannulation knowledge among emergency paramedics in the published literature from our country, even though the use of intraosseous cannulation for emergency patients is being practices. Therefore, the purpose of the present study was to determine the level of knowledge regarding intraosseous cannulation among emergency paramedics. The knowledge related to intraosseous cannulation among emergency paramedics was assessed through structured validated test questions. Fifteen paramedics participated in this study. Majorities of participants were male (86.6%). The age group ranged from 22 – 45 old years. The working experiences were from two to thirteen years. There was only 1 out of 15 participants who had scored 75%. The majority (10) scored 40% to 50%. This suggests that necessity in teaching of intraosseous cannulation among emergency paramedics needs to be emphasised.

Keywords: paramedics' knowledge, intraosseous cannulation, alternative, intravenous access

INTRODUCTION

Access to an intravenous (IV) route is very crucial in emergency patients under resuscitation. Immediate actions for vascular access are important to administrate fluids and drugs especially for patients in critical condition with collapsed peripheral veins. Studies show that the failure rates of IV access in emergency situations are described between 10-40% (Lapostolle et al. 2007; Lewis 1986; Minville et al. 2006). Furthermore, accessibility to peripheral IV took an average time up to 2.5-13 minute and more worse even up to 30 minutes in case of vascular collapsed (Costantino & Fojtik 2003; Costantino et al. 2005). Thus, it will delay the treatment of patients (Turner et al. 2000).

Drugs and fluids can be administered in many others ways such as sublingual, endotracheal, subcutaneous and intramuscular. However, these options are not very effective for patient with hemodynamically inconsistent and only small amounts of suitable drugs are possible to be given. Furthermore, for unstable patients who required IV access but it is impossible at emergency department the other alternative is Central Venous Catheterization (CVC) (Turner et al. 2000; American Heart Association 2005a). Nevertheless, to access a CVC an expert and patient's safety need to be considered. Therefore, an alternative means to access vascular can be done by intraosseous cannulation (AHA 2005b). Its importance in adults is less propagated, especially for in-hospital use. This procedure is not required highly qualified personnel even it is can be done by are paramedics in both; pre and in-hospital setting (Biarent et al. 2005). However, the extent of knowledge regarding intraosseous among emergency paramedics is

unknown. Therefore, the aim of this study was to determine the level of knowledge on intraosseous cannulation among emergency paramedics.

MATERIALS AND METHODS

A total of 15 emergency paramedics working at one of government hospital were recruited for this study. This was a cross-sectional study conducted using 10 structured questions (one best answer) to test the level of knowledge on intraosseous cannulation among emergency paramedics. They were required to give their consent and answer a short 6 minutes test on intraosseous cannulation knowledge. The questions were based on intraosseous cannulation knowledge which covers guideline, algorithm, indications, contraindication, location for IO puncturing, and steps of procedure. The level of knowledge on intraosseous cannulation will be determined by their score. Score of 75% and above were considered as an adequate knowledge. The questions were prepared in English. A pilot study (pre-test) was conducted on five paramedic students one week prior to the actual research work. Comments and feedback on the questions was considered to obtain a better understanding of the questions. The questions were tested and its reliability was α=0.06. A descriptive analysis was conducted to determine the level of knowledge score.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

Total of 15 emergency paramedics participated in this study. Two out of 15 were females, and the rest 13 were males. The age was between 22 to 45 years. The working experiences were from two years until 13 years. Majority of the participants were Malays (93.3%) and Indians (6.6%) in this study.

KNOWLEDGE ON INTRAOSSEOUS CANNULATION

Only one one out of 15 participants had 75% knowledge score on intraosseous cannulation followed by 4 out of 15 had 60% score. Majority of the participants scored 40% to 50%. However, there was no participant who scored less than 40% knowledge score on intraosseous cannulation. The results showed only that only one (6.7%) out 15 participants had an adequate knowledge on intraosseous cannulation.

DISCUSSION

Paramedics are the health care personnel who involved in emergency care at pre-hospital and in-hospital settings. They should be well equipped with all the necessary emergency knowledge and skills in order to perform their job better. Perhaps, rarely perform skills like intraosseous cannulation also need to be emphasised. In Malaysia, tthis procedure is not frequently performed for patient with difficulty of intravenous access. This is due to less of emphasise on the practicality of this procedure. Furthermore, lack of knowledge as well as the confidence of performing this procedure also contribute to it.

This study showed that there was only

6.7% from the total of 15 participants had an adequate knowledge on intraosseous cannulation. This was probably due to his/her working experiences in emergency department. By referring to the working experience, this participant was working for more than two years and it could be the contributing factor for him/her to gain some knowledge on this procedure. The rest showed clearly that inadequate knowledge on intraosseous cannulation and matter to increase knowledge on this skills need to be focussed. It is possible to improve the knowledge and skills on intraosseous cannulation among paramedics and it is positively shown with a study by Pfister (2007) that paramedics had performed better in term of success rate at the first attempt than physicians. This suggests that well-trained health care providers could attain an IO cannulation better.

CONCLUSION

As a conclusion, the knowledge on intraosseous cannulation among emergency paramedics needs to be improved as evidenced in this study. The lack of knowledge among emergency paramedics may increases the effect on the practices of intraosseous cannulation, which influences the mortality and morbidity of emergency patients. There is a need for education on intraosseous cannulation among paramedics who are working in emergency department.

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